

⑫ **EUROPEAN PATENT SPECIFICATION**

- ⑬ Date of publication of patent specification: 06.06.90      ⑮ Int. Cl.<sup>5</sup>: E 04 B 1/70, E 02 D 31/02  
⑭ Application number: 84105689.8  
⑯ Date of filing: 18.05.84

---

⑰ **Insulating panel for the outer insulation and outer drainage of subterranean walls.**

---

- |   |  |
|---|--|
| ⑱ Priority: 26.05.83 CH 2886/83   | ⑲ Proprietor: <b>THE DOW CHEMICAL COMPANY</b><br>2030 Dow Center Abbott Road P.O. Box 1967<br>Midland Michigan 48640-1967 (US) |
| ⑳ Date of publication of application:<br>12.12.84 Bulletin 84/50                            | ㉑ Inventor: <b>Larson, Anders G.</b><br>Glärnischstrasse 51<br>CH-8810 Horgen (CH)   |
| ㉒ Publication of the grant of the patent:<br>06.06.90 Bulletin 90/23                        | ㉓ Representative: <b>Blum, Rudolf Emil Ernst et al</b><br>c/o E. Blum & Co Patentanwälte Vorderberg 11<br>CH-8044 Zürich (CH)  |
| ㉔ Designated Contracting States:<br>AT BE DE FR GB IT LU NL SE                              |  |
| ㉕ References cited:<br>DE-A-2 936 586<br>DE-A-3 113 807<br>DE-A-3 115 026<br>DE-U-7 736 650 |  |

---

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European patent convention).

---

## Description

The invention relates to an insulating panel for thermal insulation and for water drainage of subterranean, basement, building or construction walls. The panel has a plurality of drainage channels which are open on one surface of the panel and which extend from a first panel edge to a second panel edge located oppositely thereto and are open at both panel edges.

Such insulating panels are used for thermal insulation on the outer side of the wall and for water drainage of such walls. During construction the panels are placed against the wall to be protected prior to the backfilling of earth. Apart from their temperature insulating properties these panels provide for the drainage of water, specifically rain water which can flow along the drainage channels downwardly into the ground or into water collection pipes.

Such panels having a plurality of vertically extending grooves are disclosed, e.g., in the DE—A—3 113 807 and the DE—A—3 115 026. The panels have a common drawback, however, in that the vertically extending drainage grooves of the individual panels which are located vertically on top of each other can not be properly aligned during the build-up of such outer cladding of a wall. Alternatively, the vertically stacked panels may shift laterally relative to each other or may get partly clogged such that various blockages of the draining channels occur.

An object of the invention is to provide an insulating panel of the kind mentioned above, which does not feature the aforementioned drawbacks and which provides for effective drainage at all lateral relative positions of the individual panels forming the outer covering for subterranean walls.

According to the invention, the object is achieved by providing an insulating panel wherein a connecting channel each is located in the side surfaces of the panel and extends along the first and the second panel edge and communicates with every drainage channel and extends perpendicular thereto, in that each connecting channel is offset in the direction of the panel thickness relative to the drainage channels and comprises in a side wall a plurality of openings each forming a passageway to every drainage channel, in that the panel surface comprising the drainage channels is covered by a web-like material such that the drainage channels are covered. In a second embodiment of the invention, the object is achieved by providing an insulating panel wherein a connecting channel each is located in the side surfaces of the panel and extends along the first and the second panel edge and communicates with every drainage channel and extends perpendicular thereto, in that the panel is an integral structural member and has the shape of two plate bodies located on top of one another and offset in a diagonal direction relative to each other such that every side surface of the panel has a step-like portion

whereby adjacent panels overlap partly and guide each other, and in that the panel surface comprising the drainage channels is covered by a web-like material such that the drainage channels are covered.

The subject of the invention will be described in greater detail below upon reference to the annexed drawings, wherein:

Figure 1 is a perspective view of an upper section of an insulating panel,

Figure 2 is a perspective view of adjacent end sections of two vertically positioned panels,

Figure 3 is a section through two vertically adjacent panels illustrating one embodiment of a connecting channel,

Figure 4 is a section through an upper end part of an insulating panel showing a further embodiment of the cross-section shape of the connecting channel,

Figure 5 is a view similar to the view of Figure 4 of a further embodiment of the connecting channel,

Figure 6 is a side view of an insulating panel provided with a drainage channel covering web, and

Figure 7 is a top view of the panel illustrated in Figure 6.

The insulation panel of which an upper end portion is shown in Figure 1 can be fabricated from any kind of suitable material, such as an extruded plastics material, a foamed plastics material or a mortar-bound material. In the preferred embodiment, the insulating plate is made of an extruded polystyrene foam. One main surface of the panel is provided with vertically extending parallel drainage channels 1, which extend along the entire vertical length of the panel. A connecting channel 4 is formed in the top side surface 2 of the panel. A similar connecting channel 4 is provided at the bottom side surface 3, such as is shown, for example, in Figures 2 and 3. The connecting channel 4 extends in a direction perpendicular to the drainage channels 1 and is offset relative to the drainage channels 1 in the direction of the panel thickness. As can be seen from Figures 1, 2 and 3, the drainage channels 1 partly intersect the connecting channel 4 such that the outer side wall of the connecting channel 4 has a plurality of openings 5, each of which forms a passageway communicating with the connecting channel 4 and with the drainage channels 1.

In Figure 2 there are shown two insulating panels stacked vertically on top of each other. The panels are laterally offset relative to each other such that their individual drainage channels 1 are not aligned with each other. This no longer poses a problem regarding the drainage of water, because the water draining down the drainage channels 1 of the upper panel enters into a connecting channel 4, flows horizontally along this connecting channel 4 until reaching the next drainage channel 1 of the lower panel through which it can flow freely further down. Such lateral off-set installation of adjoining insulating panels

may also be made on purpose such that during back-filling of the earth, for example, only the individual drainage channels 1 of the uppermost panel may be filled with debris (e.g., soil, gravel, and the like) because the path for such debris to the lower panel is securely blocked by such an off-set arrangement.

Referring to Figure 3 there is shown a preferred cross-sectional shape of a connecting channel 4, which in this case has a rectangular cross-section. In order to promote the drainage of water running along a connecting channel 4, the bottom 6 of the connecting channel 4 may extend obliquely towards the drainage channels, as illustrated in Figure 4. Obviously, a large variety of cross-sectional shapes of the connecting channels 4 is possible, one further semi-circular shape is illustrated in Figure 5.

Attention is now drawn to Figure 6. The insulating panel of the embodiment shown is an integral both having stepped side walls. It basically has the shape of two panel bodies 7 and 8 located on top of each other such that they are offset in a lateral direction relative to each other. This will not only result in a mutual guiding of adjacent panels, but also prevent foreign bodies, for instance small-sized bodies of backfill, to enter between the two panels.

The panel surface in which the drainage channels 1 are located is covered by a web-like material 11, such that the drainage channels 1 are protected from the incursion of foreign materials into the channels which may block the flow of water along the channels. As in the preceding embodiment, the panel of Figure 6 has connecting channels 4 (not shown). The covering web 11 may be of any kind of material as long as it is water permeable. According to Figures 6 and 7 this covering web or porous sheet projects over two adjacent sides 3, 9 of the panel, such that the covering webs 11 of two adjoining panels overlap each other. The advantage of this embodiment is that an imperfect alignment of neighboring or adjacent, respectively, panels cannot have any detrimental effect regarding the entry of foreign particles. This overlapping design on the one hand of the edges and on the other hand of the covering webs can also allow for an at least temporary locking of adjacent panels during installation by any kind of a sharp pointed object.

### Claims

1. Insulating panel for the thermal insulation and water drainage on the exterior side of subterranean walls, said panel having a plurality of open drainage channels (1) provided on one surface of the panel and extending from a first edge to a second edge located oppositely thereto, said channels (1) being open at both panel edges, characterized in that a connecting channel (4) each is located in the side surfaces (2, 3) of the panel and extends along the first and the second panel edge and communicates with every drainage channel (1) and extends perpendicular thereto, in that each

connecting channel (4) is offset in the direction of the panel thickness relative to the drainage channels (1) and comprises in a side wall a plurality of openings (5) each forming a passage-way to every drainage channel (1), and in that the panel surface comprising the drainage channels (1) is covered by a weblike material (11) such that the drainage channels (1) are covered.

2. Insulating panel of claim 1, characterized in that at least one of the connecting channels (4) has a generally rectilinear cross-sectional shape.

3. Insulating panel of claim 1, characterized in that at least one of the connecting channels (4) comprises a bottom extending in a direction obliquely towards the drainage channels (1).

4. Insulating panel of claim 1, characterized in that the weblike covering material (11) is formed by a water-penetrable material web.

5. Insulating panel for the thermal insulation and water drainage on the exterior side of the subterranean walls, said panel having a plurality of open drainage channels (1) provided on one surface of the panel and extending from a first edge to a second edge located oppositely thereto said channels (1) being open at both panel edges, characterized in that a connecting channel (4) each is located in the side surfaces (2, 3) of the panel and extends along the first and the second panel edge and communicates with every drainage channel (1) and extends perpendicular thereto, in that the panel is an integral structural member and has the shape of two plate bodies (7, 8) located on top of one another and offset in a diagonal direction relative to each other such that every side surface of the panel has a step-like portion, whereby adjacent panels overlap partly and guide each other, and in that the panel surface comprising the drainage channels (1) is covered by a weblike material (11) such that the drainage channels (1) are covered.

### Patentansprüche

1. Isolierplatte für die Wärmeisolierung und Wasserableitung auf der Außenseite von unterirdischen Wänden, wobei die Platte eine Vielzahl von offenen Drainagekanälen (1) an einer Plattenoberfläche aufweist, die sich von einer ersten Kante bis zur gegenüberliegenden zweiten Kante erstrecken, und die Kanäle (1) an beiden Kanten der Platte offen sind, dadurch gekennzeichnet, daß ein Verbindungskanal (4) auf jeder der Seitenfläche (2, 3) der Platte ausgebildet ist, der sich entlang der ersten und zweiten Plattenkante erstreckt und in Verbindung mit jedem Drainagekanal (1) steht und sich senkrecht zu diesen erstreckt, daß jeder der Verbindungskanäle (4) in Richtung der Plattendicke relativ zu den Drainagekanälen (1) versetzt ist und in einer Seitenwand eine Vielzahl von Öffnungen (5) als Durchlaß zu jedem Drainagekanal (1) vorhanden sind und daß die die Drainagekanäle (1) aufweisende Plattenoberfläche mit einem bahnförmigen Material (11) so bedeckt ist, daß die Drainagekanäle (1) abgedeckt sind.

2. Isolierplatte nach Anspruch 1, dadurch

gekennzeichnet, daß mindestens einer der Verbindungskanäle (4) einen im allgemeinen gradlinigen Querschnitt aufweist.

3. Isolierplatte nach Anspruch 1, dadurch gekennzeichnet, daß mindestens einer der Verbindungskanäle (4) einen Boden aufweist, der zu den Drainagekanälen (1) geneigt ist.

4. Isolierplatte nach Anspruch 1, dadurch gekennzeichnet, daß das bahnförmige Abdeckmaterial (11) eine wasserdurchlässige Materialbahn ist.

5. Isolierplatte für die Wärmeisolierung und Wasserableitung auf der Außenseite von unterirdischen Wänden, wobei die Platte eine Vielzahl von offenen Drainagekanälen (1) an einer Plattenoberfläche aufweist, die sich von einer ersten Kante bis zur gegenüberliegenden zweiten Kante erstrecken, und die Kanäle (1) an beiden Kanten der Platte offen sind, dadurch gekennzeichnet, daß ein Verbindungskanal (4) auf jeder der Seitenflächen (2, 3) der Platte ausgebildet ist, der sich entlang der ersten und zweiten Plattenkante erstreckt und in Verbindung mit jedem Drainagekanal (1) steht und sich senkrecht zu diesen erstreckt, daß die Platte ein einteiliges Bauteil ist in Form von zwei Plattenkörpern (7, 8), die übereinander und in diagonalen Richtung gegeneinander versetzt angeordnet sind, so daß jede Seitenfläche der Platte ein stufenförmiges Teil hat, wobei sich benachbarte Platten teilweise überlappen und gegenseitig führen, und daß die Drainagekanäle (1) aufweisende Plattenoberfläche mit einem bahnförmigen Material (11) so bedeckt ist, daß die Drainagekanäle (1) abgedeckt sind.

## Revendications

1. Panneau isolant pour l'isolation thermique et le drainage de l'eau sur le côté extérieur de murs souterrains, ledit panneau comportant une pluralité de canaux de drainage ouverts (1) formés sur une des faces du panneau et s'étendant depuis un premier bord jusqu'à un second bord situé en face de ce dernier, lesdits canaux (1) étant ouverts aux deux bords du panneau, caractérisé en ce qu'un canal de raccordement (4) est formé sur chacun des surfaces latérales (2, 3) du panneau et s'étend le long des premier et second bords du panneau et communique avec chaque canal de

drainage (1) en s'étendant perpendiculairement à ce dernier, en ce que chaque canal de raccordement (4) est décalé dans la direction de l'épaisseur du panneau par rapport aux canaux de drainage (1) et constitue dans une paroi latérale une pluralité d'ouvertures (5) formant chacune un passage jusqu'à chaque canal de drainage (1), et en ce que la surface du panneau comprenant les canaux de drainage (1) est revêtue par un matériau (11) analogue à une nappe, de telle sorte que les canaux de drainage (1) sont recouverts.

2. Panneau isolant selon la revendication 1, caractérisé en ce qu'au moins un des canaux de raccordement (4) a une forme de section droite rectiligne d'une façon générale.

3. Panneau isolant selon la revendication 1, caractérisé en ce qu'au moins un des canaux de raccordement (4) comprend un fond s'étendant obliquement en direction des canaux de drainage (1).

4. Panneau isolant selon la revendication 1, caractérisé en ce que le matériau de revêtement (11) analogue à une nappe, est formé par une nappe de matière perméable à l'eau.

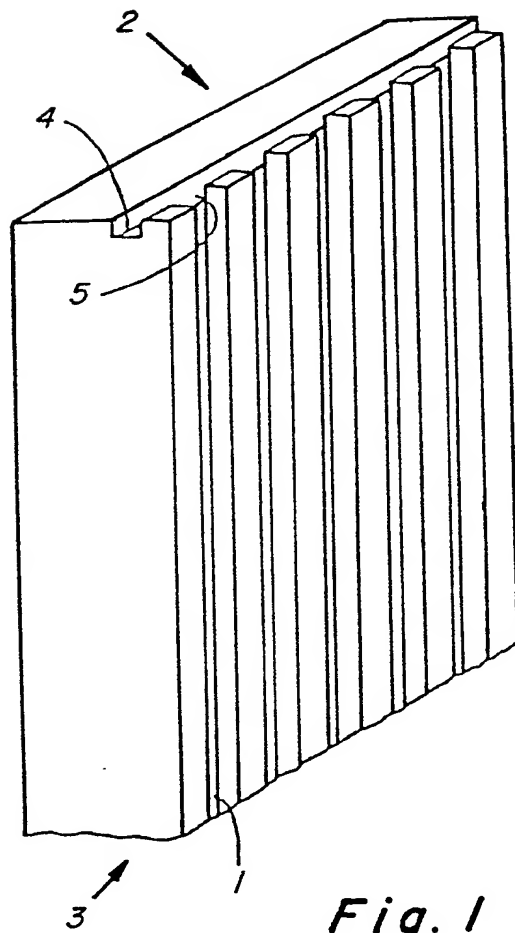
5. Matière isolante pour l'isolation thermique et le drainage de l'eau sur le côté extérieur de murs souterrains, ledit panneau comportant une pluralité de canaux de drainage ouverts (1) formés sur une des faces du panneau et s'étendant depuis un premier bord jusqu'à un second bord situé à l'opposé de ce dernier, lesdits canaux (1) étant ouverts aux deux bords du panneau, caractérisée en ce qu'un canal de raccordement (4) est formé dans chacune des surfaces latérales (2, 3) du panneau et s'étend le long des premier et second bords du panneau et communique avec chaque canal de drainage (1) en s'étendant perpendiculairement à ce dernier, en ce que le panneau est un élément structural monobloc et a la forme de deux corps plats (7, 8) placés l'un sur l'autre et décalés diagonalement l'un par rapport à l'autre, de telle sorte que chaque surface latérale du panneau comporte une partie analogue à un gradin, grâce à quoi les panneaux adjacents se recouvrent partiellement et se guident mutuellement, et en ce que la face du panneau comprenant des canaux de drainage (1) est revêtue par un matériau (1) analogue à une nappe, de sorte que les canaux de drainage (1) sont recouverts.

55

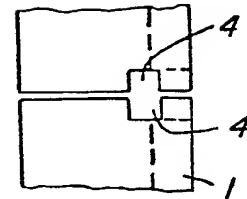
60

65

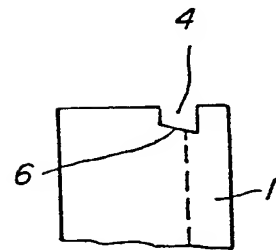
4



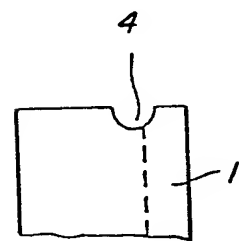
*Fig. 1*



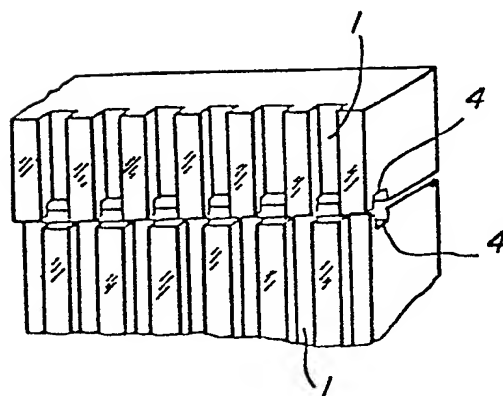
*Fig. 3*



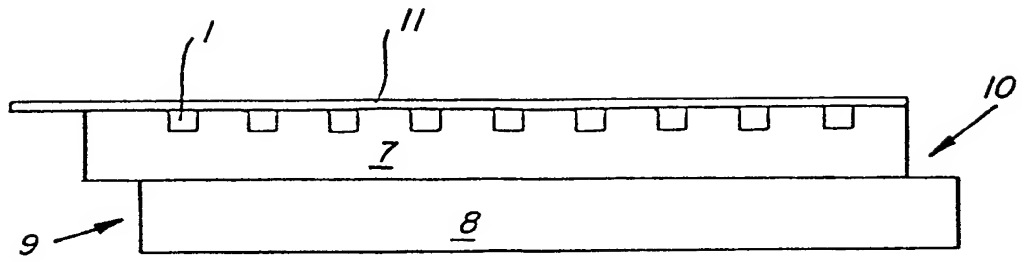
*Fig. 4*



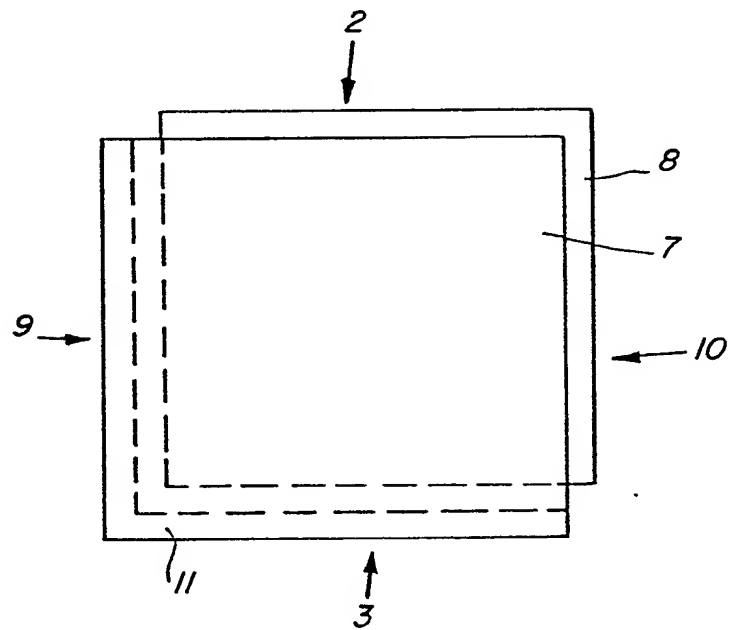
*Fig. 5*



*Fig. 2*



*Fig. 6*



*Fig. 7*